

DESCRIPTION

PREFABRICATED RESIN HOUSE

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TECHNICAL FIELD

The present invention relates to a prefabricated resin house having a living space formed therein by assembling a plurality of structural members constituted of a resin such as styrene foam or fiber reinforced plastic (FRP).

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BACKGROUND ART

Outdoor-type accommodation facilities known in the related art include wooden bungalows (cottages or huts). The cost of building a wooden bungalow is high and it requires several days to complete the construction work. While there are tent-type accommodation facilities, their durability is poor and they are not attractive, which limits their installation locations.

Keeping in mind the shortcomings of the background art discussed above, the inventor of the present invention and the like proposed a prefabricated dome in International Publication No. WO 01-44593. This prefabricated dome forms therein a semi-spherical space achieved by assembling a plurality of dome pieces constituted of styrene foam. The prefabricated dome, which can be constructed quickly at low

cost, can be used as an outdoor accommodation facility, a residential building or the like.

The dome pieces disclosed in International Publication No. WO01/44593 have a shape achieved by dividing a semi-sphere from the zenith along meridians into 10 equal pieces. The size of the dome pieces is determined in conformance to the diameter of the floor portion of a living space and the height to the zenith. Thus, the individual dome pieces tend to be extremely large, and the transportability of such structural members is an issue yet to be adequately addressed.

DISCLOSURE OF THE INVENTION

The present invention provides a prefabricated resin house that can be achieved by using more compact structural members.

The prefabricated resin house according to the present invention includes a peripheral wall achieved by assembling a plurality of peripheral wall structural members constituted of resin and a roof that is formed by assembling a plurality of roof structural members constituted of resin and is placed on top of the peripheral wall.

Compared to the size of dome pieces assembled to achieve the dome structure in the related art, each ranging continuously from the floor surface to the ceiling, the size

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(maximum length) of each structural member can be reduced and, as a result, the transportability is improved.

It is desirable to constitute the peripheral wall structural members and the roof structural members with
5 styrene foam. The roof may include an eave projecting out over the external circumference and an interlocking portion on the inner side of the eave and an interlocking portion at the upper end of the peripheral wall may be connected and bonded to each other. Interlocking portions may be formed
10 at the end surfaces on the two sides of each peripheral wall structural member and each roof structural member so as to interlock and bond them at the interlocking portions. A house may be erected by assembling the peripheral wall with the, assembling the roof with the roof structural members and
15 then placing the assembled roof on top of the peripheral wall.

The peripheral wall may assume a substantially cylindrical shape or a substantially rectangular
parallelepiped shape. It is desirable to adopt a ribbed structure in the connecting areas where the peripheral wall
20 structural members connect with each other and in the connecting areas where the roof structural members connect with each other.

A frame of the prefabricated house may be formed by assembling steel frame members, and the peripheral wall
25 structural members and the roof structural members may be

individually mounted from the outside of the frame. In such a case, it is desirable to use steel frame members constituted of a C-type steel and having a substantially U-shaped section.

5 Alternatively, the house may include a plurality of strengthening members extending from the zenith of the dome toward the foundation in an arch along meridians, which are disposed over predetermined intervals along the circumference, and a resin outer wall constituted with a
10 plurality of structural members separated from one another along meridians, which are stacked from the foundation toward the zenith of the dome between each pair of strengthening members, so as to assure a sufficient level of structural strength.

15 It is desirable to form the resin outer wall by bonding structural members constituted of styrene foam. The outer wall may be formed by forming interlocking portions at the end surfaces of each structural member on the two sides and interlocking the structural members at the interlocking
20 portions facing opposite each other. Interlocking portions may be formed at the bottom surfaces of the peripheral wall structural members and these interlocking portions may be interlocked with positioning members fixed in advance under the peripheral wall structural members.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1(a) is a perspective providing an overall view of the prefabricated styrene foam house achieved in a first embodiment of the present invention and FIG. 1(b) is a

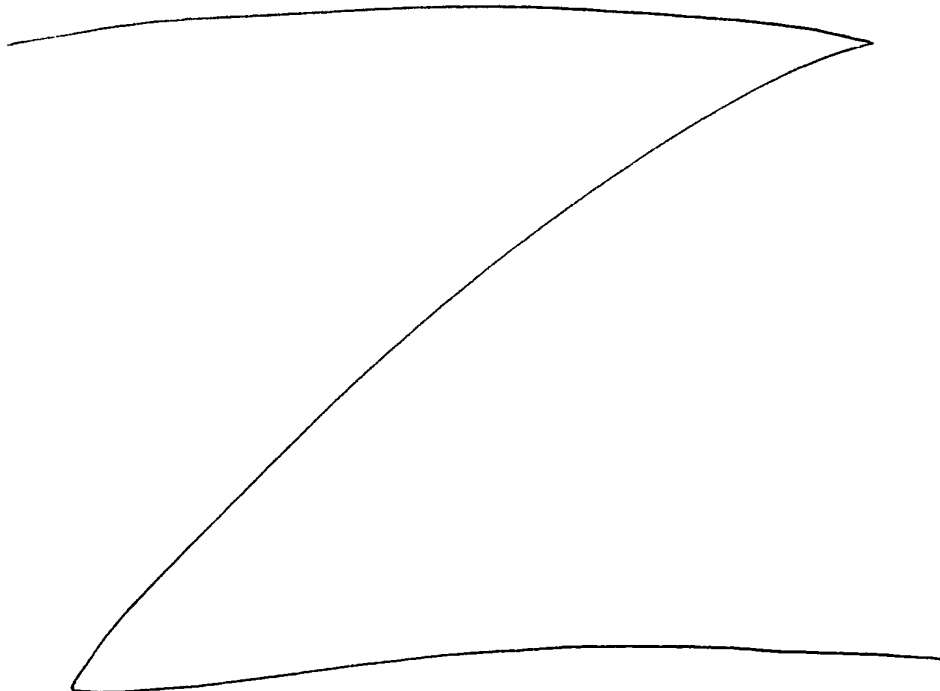
5 perspective of a house achieved by adjusting the height;

FIG. 2 is a sectional view of the prefabricated resin house in FIG. 1;

FIG. 3 is an exploded perspective of the prefabricated resin house in FIG. 1;

10 FIGS. 4(a) through 4(d) each present a sectional view that shows in detail the interlocking structure that may be adopted at side end surfaces of the peripheral wall structural members or the bonding portions at side end surfaces of the roof structural members in FIG. 1;

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FIGS. 7(a) and 7(b) show an example of another method that may be adopted when fixing the L-shaped base portions DB of the peripheral wall 10 to the foundation. At the

5 L-shaped base portions DB, bolt holes BTH are formed over equal intervals. Anchor bolts AB set in place at the base portion mounting surface of the foundation 40 are inserted through the bolt holes BTH and then are tightened with nuts NT.

10 If peripheral wall structural members 11' through 19' include base portions DBA that do not have an L shape, the peripheral wall structural members 11' through 19' may be fixed to the foundation 40, as shown in FIG. 8. In this case, the base portions DBA include bolt holes BTH formed as through

15 holes passing from the outer surface to the inner surface and anchor bolts AB set at the base portion mounting surface 40P of the foundation 40 are inserted through the bolt holes BTH and then tightened with nuts NT.

As shown in FIGS. 9 and 10, the eave HS may be omitted.

20 A prefabricated styrene foam house 100A includes a peripheral wall 10A constituted of styrene foam and a roof 30A constituted of styrene foam. The peripheral wall 10A differs from the peripheral wall 10 in FIG. 1 in the shape of the staged area at its upper end. The peripheral wall 10A

25 in FIGS. 9 and 10 includes a staged portion STS having a lower

stage on the internal circumferential side. The roof 30A, which, unlike the roof in FIG. 1, does not have an eave HS, still achieves an overall shape of a sphere segment which looks a bowl put upside down, as does the roof in FIG. 1. At
5 the lower end of the roof 30A, a staged portion STR is formed in the shape corresponding to the shape of the staged portion STS at the peripheral wall 10A. Other structural features are similar to those shown in FIGS. 1 through 7. However, the wall thickness of the roof structural members 31A through
10 39A remains constant from the top through the lower end.

The peripheral wall structural members 11 through 19 may each be further divided into smaller pieces along the lengthwise (vertical) direction to further improve the transportability.

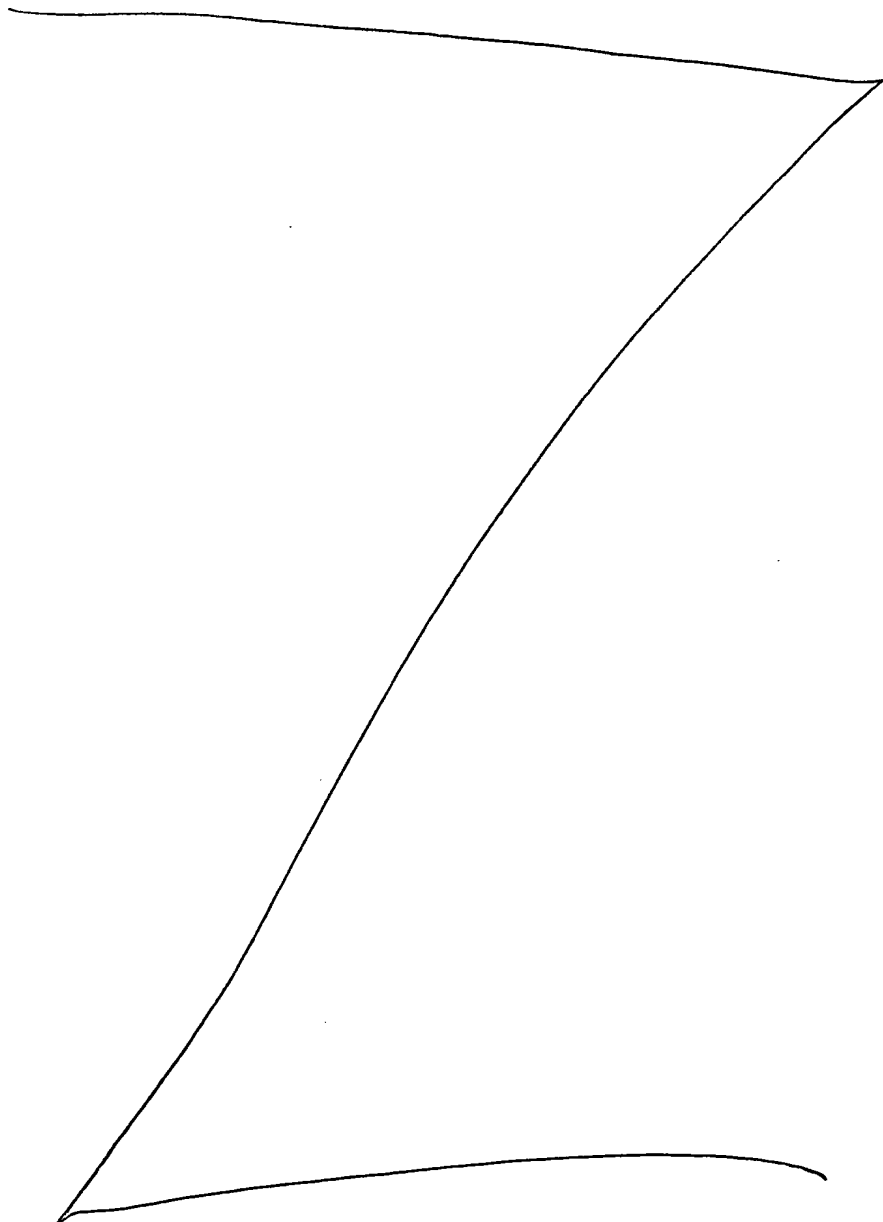
15 -Second Embodiment-

The second embodiment is now explained in reference to FIGS. 11 through 15. In the second embodiment, steel frame members or laminated wood members are used as strengthening members of a styrene foam house.

20 FIG. 11 is a perspective presenting an overall view of the prefabricated styrene foam house achieved in the second embodiment and FIG. 12 is an exploded perspective of the prefabricated styrene foam house. The prefabricated styrene foam house 200 having a semispherical shape on the
25 whole includes strengthening members 40 constituted of steel

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or laminated wood and a dome peripheral wall 60 constituted
of styrene foam. The strengthening members 40, extending in
an arch from a zenith 20 to the foundation surface along
meridians, are disposed over equal intervals along the
5 circumference.



CLAIMS

1. A prefabricated resin house, comprising:
a peripheral wall formed by assembling a plurality of
resin peripheral wall structural members; and

5 a roof formed by assembling a plurality of resin roof
structural members, which is placed on top of the peripheral
wall.

2. A prefabricated resin house according to claim 1,
10 wherein:

the peripheral wall is formed by bonding together a
plurality of peripheral wall structural members each
comprising styrene foam; and

the roof is formed by bonding together a plurality of
15 roof structural members each comprising styrene foam.

3. A prefabricated resin house according to claim 1 or
claim 2, wherein:

the roof includes an eave projecting over a perimeter
20 of the peripheral wall, which is formed as an integrated part
thereof, and the roof is bonded to the peripheral wall by
fitting an interlocking portion formed inside the eave with
an interlocking portion formed at an upper end of the
peripheral wall.

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4. A prefabricated resin house according to any of claims
1 through 3, wherein:

interlocking portions are formed at side end surfaces
on both sides of each of the peripheral wall structural
5 members and the peripheral wall structural members are bonded
to each other by fitting interlocking portions facing
opposite each other; and

interlocking portions are formed at side end surfaces
on both sides of each of the roof structural members and the
10 roof structural members are bonded to each other by fitting
interlocking portions facing opposite each other.

5. A prefabricated resin house according to any of claims
1 through 4, wherein:

15 the roof preassembled with the roof structural members
is set on top of the peripheral wall formed by assembling the
peripheral wall structural members.

6. A prefabricated resin house according to any of claims
20 1 through 5, wherein:

the peripheral wall assumes a substantially
cylindrical shape.

7. A prefabricated resin house according to any of claims
25 1 through 5, wherein:

the peripheral wall assumes a substantially rectangular parallelepiped shape.

8. A prefabricated resin house according to claim 7,
5 wherein:

a ribbed structure is adopted in connecting portions at which the peripheral wall structural members are interlocked with each other and connecting portions at which the roof structural members are interlocked with each other.

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9. A prefabricated resin house according to any of claims 1 through 7, wherein:

a frame of the prefabricated house is formed by assembling steel frame members, and the peripheral wall and
15 the roof are assembled via the frame by individually mounting the peripheral wall structural members and the roof structural members from outside the frame.

10. A prefabricated resin house according to claim 9,
20 wherein:

the steel frame members are constituted of C-type steel having a substantially U-shaped section.

11. A prefabricated resin house, comprising:

a plurality of strengthening members extending in an arch from a zenith of a dome toward a foundation along meridians, which are disposed over predetermined intervals along a circumferential direction; and

5 a resin outer wall formed by stacking a plurality of structural members separated from each other along the meridians from the foundation toward the zenith of the dome between a pair of strengthening members.

10 12. A prefabricated resin house according to claim 11, wherein:

the resin outer wall is formed by bonding together a plurality of structural members comprising styrene foam.

15 13. A prefabricated resin house according to claim 11 or claim 12, wherein:

interlocking portions are formed at side end surfaces on both sides of each of the structural members and the outer wall is formed by engaging and bonding interlocking portions
20 facing opposite each other.

14. A prefabricated resin house according to any of claims 1 through 13 wherein:

an interlocking portion is formed at a bottom surface
25 of each of the peripheral wall structural members and the

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interlocking portion is fitted with a positioning member
fixed in advance under the peripheral wall structural member.